



U.S. Department  
of Transportation  
Federal Aviation  
Administration

# Advisory Circular

**Subject:** Acceptance and Approval Of  
Electronic Signatures, Electronic  
Recordkeeping System, and Electronic  
Manuals

**Date:** xx/xx/xx

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**Initiated by:** AFS-330

**Change:**

## 1. WHAT IS THE PURPOSE OF THIS ADVISORY CIRCULAR (AC)?

a. This AC is not mandatory and does not constitute a regulation. This AC provides guidance on the acceptance and approval of electronic signatures to satisfy certain operational and maintenance requirements. This AC also provides guidance on the acceptability and approval of electronic recordkeeping systems and electronic manuals that may be required by Title 14 of the Code of Federal Regulations (14 CFR). After the Federal Aviation Administration (FAA) accepts or approves an electronic signature, recordingkeeping and/or manual system, that system may be used to generate aircraft records (such as load manifest, dispatch release, aircraft maintenance records, maintenance task cards, pilot training records, flight release, airworthiness release, flight test reports, etc.) when these records can be properly authenticated.

**NOTE: In this AC, the term “electronic signature” refers to either electronic signatures or digital signatures. The specific electronic signature used depends on the end user’s preference and the system application.**

b. This AC describes an acceptable means, but not the only means, of complying with the FAA’s operational and maintenance requirements. Specifically, handwritten signatures, records and mechanic’s stamps continue to be acceptable. However, if you use the electronic means described in the AC, you must conform to it in all important respects.

## 2. WHO DOES THIS AC APPLY TO?

- Foreign air carriers or foreign persons conducting 14 CFR part 129 operations with U.S. Registered Aircraft (§ 129.14).
- Air carriers or air operators conducting 14 CFR part 121 or 135 operations.
- Operators conducting operations under 14 CFR parts 91, 91 subpart K (91K), 125, 133, or 137.
- Persons performing airmen certification under 14 CFR parts 61, 63, 65, 141, and 142.
- Individuals performing maintenance or preventive maintenance under 14 CFR part 43.
- Repair stations under 14 CFR parts 145.
- Aviation maintenance technical schools under 14 CFR parts 147.

## 3. FOR PURPOSES OF THIS AC, WHAT DEFINITIONS APPLY?

**a. Accepted.** FAA consent, where formal approval is not required, to proposals, requests, techniques, and manual contents (tools, materials, equipment, etc.), that the agency and the certificate holder or operator have agreed to should be submitted to the FAA for review and acceptance prior to use. The FAA indicates acceptance through various means such as a letter, or verbal acceptance or statement of no objection.

**b. Approved.** Official, formal consent by the FAA, that is required before a certificate holder or operator may initiate or revise its operations, programs, procedures, or manuals. The FAA grants approval by letter, by a stamp of approval, by the issuance of operations specification (OpSpecs)/management specification (MSpecs)/training specification (TSpecs)/letter of authorization (LOA), or by some other official means of conveying approval.

**c. Authentication.** The means by which a system validates an authorized user's identity. These may include a password, a Personal Identification Number (PIN), a cryptographic key, or badge swipe.

**d. Computer Hardware.** A computer and the associated physical equipment directly involved in the performance of communications or data processing functions.

**e. Computer Software.** Written or printed data, such as programs, routines, and symbolic languages, essential to the operation of computers.

**f. Digital Signature.** Cryptographically generated data that identifies a document's signatory (signer) and certifies that the document has not been altered. Digital signature technology is the foundation of a variety of security, electronic business, and electronic commerce products. This technology is based on public/private key cryptography, digital signature technology used in secure messaging, Public Key Infrastructure (PKI), virtual private network (VPN), web standards for secure transactions, and electronic digital signatures.

**g. Electronic Manuals.** Consists of operational and/or maintenance manuals that may be electronically signed, stored, and retrieved by a computer system via CD ROM, internet/intranet based, or in other various other forms of electronic media. Electronic manuals may consist of approved data, accepted or approved data and/or reference data used in aircraft maintenance or operations.

**NOTE: Electronic manuals for the purpose of this AC, do not include electronic manuals created under a Manufacturing Authority (i.e., type certificate (TC), Supplemental Type Certificate (STC), Part Manufacturer Approval (PMA), etc.) such as Original Equipment Manufacturer (OEM) flight manuals, maintenance manuals, overhaul manuals, etc., or manuals authorized for use on an Electronic Flight Bag (EFB). See current edition of AC 120-76, Guidelines for the Certification, Airworthiness, and Operational Use of Electronic Flight Bags.**

**h. Electronic Recordkeeping System.** A system of record processing in which records are entered, electronically signed, stored, and retrieved electronically by a computer system rather than in the traditional "hard copy" or paper form.

**i. Electronic Signature.** The online equivalent of a handwritten signature. It is an electronic sound, symbol, or process attached to or logically associated with a contract or other record and executed or adopted by an individual. It electronically identifies and authenticates an individual entering, verifying, or auditing computer-based records. An electronic signature combines cryptographic functions of digital signatures with the image of an individual's handwritten signature or some other visible mark considered acceptable in a traditional signing process. It authenticates data with a hash algorithm and provides permanent, secure user-authentication.

**j. Signature.** Any form of identification used to acknowledge completion of an act and authenticate a record entry. A signature must be traceable to the individual making the entry, and it must be handwritten or part of an electronic signature system or other form acceptable to the FAA.

#### **4. WHY IS THE FAA PROVIDING GUIDELINES FOR ELECTRONIC SIGNATURES, ELECTRONIC RECORDKEEPING SYSTEMS, AND ELECTRONIC MANUALS?**

**a.** The Government Paperwork Elimination Act (GPEA), Public Law (PL) 105-277, Title XVII, and the Electronic Signatures in Global and National Commerce Act (E-Sign), PL 106-229, encourage use of electronic signatures. When electronic signatures are used and accepted or approved, electronic recordkeeping and document transfer will also be encouraged meeting the goals of the Small Business Paperwork Relief Act of 2002. This AC represents the FAA's effort to implement these laws to meet certain FAA operational and maintenance requirements.

**b.** Before the enactment of E-Sign on June 30, 2000, the regulations on signatures acknowledging satisfaction of maintenance and operational requirements did not reflect current advances in information storage and retrieval technology. These earlier rules were developed when use of electronic media for the storage and retrieval of data was neither available to, nor contemplated by, the aviation industry or the FAA.

**c.** As the complexity of aircraft design, operations, and maintenance processes increased, the number of records and documents generated and required to be retained by aircraft owners, operators, manufacturers, and repair facilities expanded dramatically. Electronic information storage and retrieval systems have enhanced significantly the aviation industry's ability not only to meet FAA record-retention requirements, but also to manufacture, operate, and maintain today's highly complex aircraft and aircraft systems in a demanding operational environment.

**d.** The OMB, Executive Office of the President, has issued OMB Circular A-130. This document directs the FAA and other government agencies to recognize the limitations on electronic recordkeeping systems due to restrictions on the use of electronic signatures. With this AC, the FAA recognizes this limitation and now permits the use of electronic signatures on certain maintenance and operational records. Owners, operators, and maintenance personnel may now use complete electronic recordkeeping systems because *the requirement to authenticate documents with non-electronic signatures has been eliminated*. Such systems may now be used to generate aircraft records (e.g., load manifests, dispatch releases, maintenance task cards,

aircraft maintenance records, flight releases, airworthiness releases, and flight test reports) that can be properly authenticated with an electronic signature.

**NOTE: Part 91 operators are not required to obtain FAA acceptance prior to maintaining records electronically, however, part 91 operators may obtain FAA acceptance to maintain records electronically.**

**NOTE: Any owner or operator who sells a U.S.-registered aircraft must transfer the records of that aircraft, in plain language form or in coded form, at the election of the purchaser. Any coded form must provide for the preservation and retrieval of information in a manner acceptable to the Administrator.**

e. Acceptance or approval of electronic signatures will encourage the use of electronic maintenance record retention and record entry requirements for maintenance, preventive maintenance, inspection, rebuilding, and alteration records. The use of electronic records will also enhance the ability to retrieve and sort historical information.

f. Using electronic signatures and various computer systems will also enhance communication with local Flight Standards District Offices (FSDO) or certificate-holding district office (CHDO). Electronic signature use provides an efficient method for the transmission of manual revisions and other documents between operators and the FAA.

**NOTE: Using electronic signatures will make it easier to identify a document signer (signatory). Electronic signature use helps eliminate the traceability difficulties associated with illegible handwritten entries and the deterioration of paper documents.**

## **SECTION 1. DISCUSSION—ELECTRONIC SIGNATURE.**

### **5. WHAT DOES THE FAA ACCEPT OR APPROVE AS AN ELECTRONIC SIGNATURE?**

a. **General.** Before the FAA permitted the use of electronic signatures, only handwritten signatures were allowable for use on any required record, record entry, or document. The electronic signature's purpose is identical to that of a handwritten signature or any other form of signature currently accepted or approved by the FAA. The handwritten signature is universally accepted and approved because it has certain qualities and attributes (e.g., subparagraph c(4)(d) below concerning employee termination) that must be preserved in any electronic signature. Therefore, an electronic signature must possess those qualities and attributes that guarantee a handwritten signature's authenticity.

#### **b. Forms of Electronic Signatures.**

(1) An electronic signature may be in the following forms.

- A digital signature,
- A digitized image of a paper signature,

- A typed notation,
- An electronic code, and
- Any other unique form of individual identification that can be used as a means of authenticating a record, record entry, or document.

(2) Not all identifying information found in an electronic system may constitute a signature. For example, the entry of an individual's name in an electronic system may not constitute an electronic signature. Other guarantees equal to those of a handwritten signature should be provided.

**c. Attributes of an Electronic Signature.** First and foremost, an electronic signature must be part of a well-designed program. This program should, at a minimum, consider the following.

**(1) Uniqueness.** An electronic signature must retain those qualities of a handwritten signature that guarantee its uniqueness. A signature should identify a specific individual and be difficult to duplicate. A unique signature provides evidence that an individual agrees with a statement. An electronic system cannot provide a unique identification with reasonable certainty unless the identification is difficult for an unauthorized individual to duplicate. An acceptable method of proving the uniqueness of a signature is by using an identification and authentication procedure that validates the identity of the signatory. For example, an individual using an electronic signature should be required to identify himself or herself, and the system that produces the electronic signature should then authenticate that identification. Acceptable means of identification and authentication include the use of separate and unrelated identification and authentication codes. These codes could be encoded onto badges, cards, cryptographic keys, or other objects. Systems using PIN or passwords are an acceptable method of ensuring uniqueness. Additionally, a system could use physical characteristics, such as a fingerprint, handprint, or voice pattern, as a method of identification and authorization.

**(2) Significance.** An individual using an electronic signature should take deliberate and recognizable action to affix his or her signature. Acceptable, deliberate actions for creating a digital electronic signature include, but are not limited to, the following:

- Badge swipes,
- Signing an electronic document with a stylus,
- Typing specific keystrokes, and
- Using a digital signature.

**(3) Scope.** The scope of information being affirmed with an electronic signature should be clear to the signatory and to subsequent readers of the record, record entry, or document. Handwritten documents place the signature close to the information to identify those items attested to by a signature. However, electronic documents may not position a signature in the same way. It is therefore important to clearly identify the specific sections of a record or document that are affirmed by a signature from those sections that are not. Acceptable methods of marking the affected areas include, but are not limited to, highlighting, contrast inversion, or the use of borders or flashing characters. Additionally, the system should notify the signatory that the signature has been affixed. The user should be asked to ensure that the identified material is, in fact, what is being signed for after affixing the signature. The user also should be

able to retrieve a report listing all places where his or her digital electronic signature has been applied. The FAA is not focused on the computer technology used to accomplish the above tasks. Instead, the FAA focus is concerned with the accuracy of the record and that the signatory is fully aware of what he or she is signing.

**(4) Signature Security.** The security of an individual's handwritten signature is maintained by ensuring that it is difficult for another individual to duplicate or alter it. An electronic signature should maintain an equivalent level of security. An electronic system that produces signatures should restrict other individuals from affixing another individual's signature to a record, record entry, or document. Such a system enhances safety by preventing an unauthorized individual from certifying required documents, such as an airworthiness release.

**(a)** A corresponding policy and management structure must support the computer hardware and software that delivers the information.

**(b)** Signature authenticity/verification: Through control and archives, the computer software should determine if the signature is genuine and if the individual is authorized to participate. This can be accomplished by comparing the signature to a public key archive or some other means. This capability should be an integral part of the computer software.

**(c)** Archiving electronically signed documents: Since no paper document with an ink signature exists, a means of safely archiving electronically signed documents should be part of any electronic signature computer software. This will provide for future authentication.

**(d)** The system should contain restrictions and procedures to prohibit the use of an individual's electronic signature when the individual leaves or terminates employment. This should be done immediately upon notification of the change in employment status.

**(e)** Procedures should be established allowing the organization to correct documents that were electronically signed in error. The signature should be invalidated anytime a superseding entry is made on the same document. (The entry should be voided but remain in place. Reference to a new entry should be made and electronically signed and dated.)

**(5) Non-repudiation.** An electronic signature should prevent a signatory from denying that he or she affixed a signature to a specific record, record entry, or document. The more difficult it is to duplicate a signature, the likelier the signature was created by the signatory. The system's security features that make it difficult for others to duplicate signatures or alter signed documents usually ensure that a signature was indeed made by the signatory. Many off-the-shelf computer software packages contain a self-sign utility. Although such computer software can provide an electronic signature for individuals or a group of individuals participating in an electronic signature program, a self-sign utility by itself cannot be used. However, it can become the basis of a digital signature program if the public and private keys are issued and controlled by a trusted third party.

**(6) Traceability.** An electronic signature should provide positive traceability to the individual who signed a record, record entry, or any other document.

**d. Other Acceptable Forms of Signature/Identification.** Although this AC specifically addresses electronic signatures, other types of signatures, such as a mechanic's stamp, may also be acceptable to the FAA. If identification other than a handwritten signature is used, access to that identification should be limited to the named individual only. For example, the individual should secure a mechanic's stamp when it is not in use. Similarly, a computer entry used as a signature should have restricted access that is limited by an authentication code that is changed periodically. Access to issued stamps or authentication codes should be limited to the user. Although a signature may take many forms, the FAA emphasizes that not all electronic entries may satisfy the criteria to qualify the entry as an acceptable signature.

**e. Compliance with Other Regulatory Requirements.** Although the FAA now permits the use of electronic signatures to meet certain FAA operational and maintenance requirements, records must continue to meet current regulatory requirements. A proper signature affixed to an improperly created document still results in a document that does not meet regulatory requirements. Methods and procedures used to generate an electronic signature must therefore meet all regulatory requirements for a recordkeeping system to be used by owners, operators, or maintenance personnel. In addition, electronic signatures should only be used to satisfy the maintenance and operational requirements relating to this AC. Electronic signatures may not be considered acceptable in other areas covered by 14 CFR having more specific applicability (i.e., legal depositions and various other applications). Although the acceptance or approval of electronic signatures will foster the use of electronic recordkeeping systems, the FAA continues to accept paper documents to satisfy current regulatory requirements.

## **6. HOW DOES AN OPERATOR OR INDIVIDUAL RECEIVE FAA ACCEPTANCE OR APPROVAL TO USE AN ELECTRONIC SIGNATURE?**

**a. Announcing Intent to Use Electronic Signatures.** Certificate holders and operators intending to use electronic signatures should consult with their local FSDO or CHDOs before implementing an electronic system. To obtain FAA acceptance or approval, part 91 operators should submit a letter to the appropriate FSDO or CHDO (see Appendix 1, Sample Letter of Intent to Use Electronic Signature, Electronic Recordkeeping, or Electronic Manuals, for sample letter) describing the proposed system and include the proposed section or revision to the operator's manual.

**b. Description of Electronic System and Proposed Manual Changes.** The electronic system description should explain how electronic signatures will be used in the operator's maintenance and operational activities. The proposed manual section or revision should clearly state who in the organization has authority and the overall responsibility for implementing, modifying, revising, and monitoring the electronic signature computer software. In addition, the operator's manual must explain how electronically signed documents required aboard an aircraft will be transferred (if required, in accordance with the appropriate regulations) prior to the aircraft's operation. Required documents include aircraft maintenance releases, dispatch releases, etc.

## **SECTION 2. DISCUSSION—ELECTRONIC RECORDKEEPING SYSTEMS.**

## **7. WHAT WILL THE FAA ACCEPT OR APPROVE AS AN ELECTRONIC RECORDKEEPING SYSTEM?**

When constructing an electronic recordkeeping system to meet the operational and maintenance requirements addressed in this AC, the following elements must be considered and addressed in the operator's manual or in the directions for the system. This information must be made available to each individual responsible for using the system.

### **a. Security.**

- (1) The electronic system should protect confidential information.
- (2) The system should ensure that the information is not altered in an unauthorized way.
- (3) A corresponding policy and management structure should support the computer hardware and computer software that delivers the information.

**b. Procedures.** Before introducing an electronic recordkeeping system, computer procedures must be incorporated into the operator's manual or in the directions for the system to include the following:

- (1) Procedures for making required records available to both the National Transportation Safety Board (NTSB) and FAA personnel. If the computer hardware and software system is not compatible with the NTSB and FAA system(s), the organization must meet the intent of the rules and provide intelligible records to the requesting agency. This shall include providing records via paper if necessary at the request of the appropriate agency.
- (2) Procedures for reviewing the computerized personal identification codes system to ensure that the system will not permit password duplication.
- (3) Procedures for auditing the computer system periodically to ensure the integrity of the system. A record of the audit should be completed and retained on file as part of the operator's record retention requirements. This audit may be a computer program that automatically audits itself.
- (4) Procedures for non-recurring audits of the computer system if the integrity of the system is suspect.
- (5) Audit procedures to ensure the integrity of each computerized workstation. If the workstations are server-based and contain no inherent attributes that enable or disable access, there is no need for each workstation to be audited.
- (6) Procedures describing how the operator will ensure that the computerized records are transmitted in accordance with the appropriate regulatory requirements to customers or to another operator, or to the FAA. The records may be either electronic or paper copies.



(7) Procedures to ensure that records required to be transferred with an aircraft are in a format (either electronic or on paper) that is acceptable to the new owner/operator and regulatory authorities (import/export).

(8) Guidelines for authorized representatives of the owner/operator to use electronic signatures and to have access to the appropriate records.

(9) A description of the training procedure and requirements necessary to authorize access to the computer hardware and software system. (Recognizing that the details will vary with the different individuals who need access, the training description may simply be part of the position description. Its location should be referenced in the manual.)

## **8. HOW DOES AN OPERATOR OR INDIVIDUAL RECEIVE FAA ACCEPTANCE OR APPROVAL TO USE AN ELECTRONIC RECORDKEEPING SYSTEM?**

**a. Announcing Intent to Use Electronic Recordkeeping.** Certificate holders and operators intending to use electronic recordkeeping must obtain FAA approval or acceptance before implementing an electronic system. To obtain FAA acceptance or approval, the certificate holder or operator must submit a letter to the appropriate FSDO or CHDO (see Appendix 1 for sample letter) describing the proposed system and include the proposed section or revision to the operator's manual.

**b. Description of Electronic System and Proposed Manual Changes;** The electronic system description should explain how the electronic recordkeeping would be used in the operator's maintenance and operational activities. The proposed manual section or revision should clearly state who in the organization has authority and the overall responsibility for implementing, modifying, revising, and monitoring the electronic recordkeeping computer software.

## **SECTION 3. DISCUSSION—ELECTRONIC MANUALS.**

### **9. WHAT WILL THE FAA ACCEPT OR APPROVE AS AN ELECTRONIC MANUAL?**

**a. General.** The FAA may accept or approve, manuals on CD-ROM, Internet-based systems, or other electronic media.

(1) The electronic format must provide adequate data accessibility, quality control, and speed distribution.

(2) Electronic manual computer hardware and software systems must deliver the same, or better, accuracy and integrity maintained by paper/microfilm-based systems. In addition, electronic manuals must still comply with requirements regarding the currency, completeness, use, or availability of the technical data.

**b. Electronic Manual Construction.** When constructing an electronic manual to meet the operational and maintenance requirements addressed in this AC, the following elements must be considered and addressed.

**(1) Storage and Retrieval.** A computer hardware and software system must store and retrieve the manual's technical data under conditions of normal operation and use. The system must not permit unauthorized modification of the data it contains.

**(2) Maintenance and Support.** Maintenance and support for the system, including provisions for outages and necessary alternative retrieval services, may be provided by sources independent of the certificate holder or operator. However, the certificate holder or operator is still responsible for compliance with all regulatory requirements and cannot be delegated.

**(3) Access to Manual.** Appropriate certificate holder or operator personnel must be able to access the manuals. Procedures for distributing the manuals/technical data may be similar to procedures distributing information contained in paper or microfilm manuals. Certificate holders or operators may use their current manual distribution system to distribute electronic manuals.

**(4) Revisions to Manual.** Procedures must be established to verify that revisions (i.e., incremental, temporary or scheduled revisions) to the technical data contained in the maintenance portion of its manual are current and complete. In addition, revisions must be accepted or approved by the appropriate authority before distribution. FAA acceptance or approval may be accomplished in accordance with subparagraph d below, Revision Control Procedures.

**(5) FAA/NTSB Access.** Any authorized FAA or NTSB representative must be able to retrieve, view, and print the information in any electronic manual, or the certificate holder or operator may provide the requested information to the FAA or NTSB. If the information is provided by the certificate holder or operator, it must be provided in a format acceptable to the requesting agency.

**(6) User Instructions.** Users should be provided information describing the electronic system's use and operation. Such information will include instructions for using publications, reference information, and system administration information. These instructions need not be in paper form. They will consist of the following:

- Electronic, context-sensitive help,
- Online or system responses to specific operator queries,
- Telephonic or electronic access to a designated assistance line, and
- Other information included in the electronic system.

**(7) Training.** A training program must be provided to those who use the electronic manual. The subject matter and objectives of the training will vary depending on the employee or contractor job responsibilities and function level within the organization. Customer training will include security awareness and policy and procedures for the system. Acceptable methods of providing this training may include, but are not limited to, classroom instruction, online or system tutorials, user guides, and simulated problem-solving exercises. Any training program will define minimum competency criteria and the method for users to demonstrate competence.

**(8) Enhancements.** Additional features (such as text searching, hypertext links, or other enhancements) that facilitate access to the information are generally not required for a system to be accepted or approved.

**c. Functional Considerations.**

**(1)** The electronic system should allow users to retrieve the technical data from any electronic manual stored in the system. The electronic manual should be able to access, navigate, and retrieve applicable information at a computer workstation. Information stored in the electronic manual may occur in either a stand-alone or a shared environment.

**(2)** The content of an electronic manual must be clearly identifiable and viewable by the user. This material must easily correlate to corresponding information in a printed version of the manual. Requested information must be displayed on a computer screen or comparable device. If connected to a paper printer, the system must be able to print any information contained in an electronic manual.

**d. Revision Control Procedures.** Electronic or paper manual revision can be submitted to the appropriate FAA FSDO/CHDO and the appropriate FAA principal inspector (PI) for acceptance or approval via electronic data transfer, email, or paper. This submission will normally contain a cover letter that requests acceptance or approval and gives a brief description of the revision. After reviewing the revision, the FAA PI will send back to the certificate holder an email or paper memorandum accepting/approving or rejecting the proposed revision. If the proposed revision is rejected, the FSDO/CHDO must provide information regarding the reason for the rejection. In most cases, the acceptance or approval of manual revisions only requires the PI to initial and date the list of affected pages. It should be noted that however, that not all manuals are approved by the FAA. For operators that have operations requiring a Continuous Airworthiness Maintenance Program, most manuals, with few exceptions, require that the manuals be “acceptable” (see part 43, § 43.13(c)). However, if the computer system uses a continuous flow of information process, a table of revisions should be used. The table of revisions must contain each chapter, section, task or sub-task number to be revised. With a table of revisions, the same process of initialing and dating the list of affected sections will apply. In either case, the copy of signed revisions will become archive copies of the manual revisions for the operator and the FAA.

**(1) Validation of Revision Control Procedures.** Procedures must be established to audit the revision process to ensure contents of the electronic system are current and complete. The revision control procedures for electronic manual data may be similar to the revision control procedures used for other storage media.

**(2) Revision Transmittal Letter/Release Notes.** Many certificate holders and operators frequently use internal distribution documents that specify the current revision number and date for each revision. If this document is provided separately, it conveys the revision number and date with applicable instructions to the users. A user can inspect and review this documentation to determine data currency.

**(3) Data Currency Audit.** Procedures must be established to ensure the currency, to include associated revision dates, of the technical data regardless of the storage media. With electronic media, page level insertion audits of manuals may no longer be necessary for users to ensure information currency.

**(4) User Responsibility.** Users of information or printed data from electronic manuals systems must ensure the information or printed data is from the most current manual.

**e. Special Considerations in Displaying Information.**

**(1) Data Content and Information Form.**

**(a)** Information retrieved from an electronic manual might be displayed in a different format than it appears on paper or microfilm pages. These formatting differences may be caused by advancements of electronic retrieval systems. The information should be identical in content regardless of its format.

**(b)** Any computer-displayed information should be readily traceable to its original source. This information must be readily accessible to the user and should be able to obtain the following:

- The manual title,
- Applicable aircraft, airframe, engine, propeller, appliance, component, or part make and model,
- Effective date of the data, and
- Revision simultaneously displayed with the technical data (e.g., on the computer screen).

**(2) Page Numbers and Revision Data.**

**(a)** Complete display of traditional letter size (8.5" x 11") documents may not be possible on certain computer displays. Frequently, the video monitor will display only one-third to one-half of a paper page, and the user must scroll through the on-screen display to see the complete page. In addition, some systems may print an entire page although the video monitor displays only a partial page. This situation may result in electronic systems assigning, displaying, or printing page numbers not matching the accepted or approved copy of the manual. Therefore, certificate holders and operators must ensure information displayed or printed can be traced to the correct revision level of the manual.

**(b)** The contents of a chapter, section, or subject in a maintenance manual may be displayed as a continuous flow of information without displaying the actual page numbers of the accepted or approved manual. The user may elect to display only a portion of a manual page. If this occurs, the organizational format of the manual should be retained, and a means of referencing the section or page of the manual from which the data was obtained should be provided. Some electronic manuals systems may provide a page number as with paper manuals. Some systems will only provide the chapter, section, and a page block or task number. In these cases, the user must output such blocks of information after selecting them.

(3) References to specific chapters, sections, or paragraphs of the manual may be used to ensure information traceability to corresponding sections of a printed version. This permits the technical data to be easily referenced by the user and ensures traceability of the information to its source.

(4) The most common method of updating a manual is to issue a revision with a list identifying the pages to which the revision applies. Each subsequently revised page contains the revision status. This same process may be applied when the manuals are in electronic format. The FAA recommends that certificate holders and operators prepare a table of revisions. That table should be included in the electronic manual to show when each page of the manual was revised. Some electronic manuals using a continuous flow of information process may not be capable of producing a list of effected pages. Therefore, a table of revisions needs to contain the revised manual, chapter, section, subject, task or sub-task numbers.

**f. Data Archive.** A maintenance recordkeeping requirement often requires retention or access to previously used technical data to support or verify a method of repair or maintenance. To comply with those traceability requirements, a certificate holder or operator must archive earlier versions of manuals to provide for future needs to duplicate, regenerate, or reconstruct maintenance instructions. The archived materials should be obtained from the original source of the data. Regardless of the source, the certificate holder or operator is responsible for ensuring the availability of any required record.

**(1) Preservation of Stored Data.** Procedures must be established to ensure the integrity of the stored technical data, regardless of the storage medium. These procedures should include:

- Ensuring that no unauthorized changes can be made,
- Selecting storage mediums that minimize regeneration of errors or deterioration,
- Exercising, refreshing, or duplicating archived technical data at a frequency compatible with the storage life of the medium (i.e., before the storage medium deteriorates), and
- Storing duplicate copies in physically separate archives to minimize the risk of data loss in the event of a fire or natural disaster.

**(2) Technological Advances.** Certificate holders and operators should ensure all electronic systems components are maintained to enable retrievable archived manuals. Future changes in data storage media may result in a need to replace current computer hardware or a need to use another storage medium. Future systems must be able to retrieve archived technical data. Otherwise, the certificate holder or operator will have to maintain the old system to ensure data availability.

## **10. HOW DOES A CERTIFICATE HOLDER OR OPERATOR RECEIVE FAA ACCEPTANCE OR APPROVAL TO USE AN ELECTRONIC MANUAL?**

**a. Announcing Intent to Use Electronic Manual.** Certificate holders and operators intending to use an electronic manual should consult with their local FSDO or CHDO before implementing an electronic system. To obtain FAA acceptance or approval, the certificate holder or operator should submit a letter to the appropriate FSDO or CHDO (see Appendix 1 for sample

letter) describing the proposed system and include the proposed section or revision to the operator's manual.

**b. Description of Electronic System.** The electronic system description should explain how the electronic manual would be used in the operator's maintenance and operational activities. The proposed manual section or revision should clearly state who in the organization has authority and the overall responsibility for implementing, modifying, revising, and monitoring the electronic manual computer software.

**11. FAA ACCEPTANCE AND APPROVAL PROCESS.** FAA review and acceptance or approval is required to use a system for electronic signatures, and/or electronic recordkeeping, and/or electronic manuals. Parts 91K, 121, 125, and 135 operators, all require review and/or acceptance or approval by either OpSpecs, LOA or by Letter of Deviation Authority (LODA).

**a.** Before accepting or granting approval, the FAA PI or FSDO must review the proposed system; this includes evaluating the electronic hardware and computer software to ensure all facets meet the intent of this AC.

**b.** The PI or FSDO will notify the operator when the review is complete, he or she will discuss any systemic deficiencies or concerns with the operator so there will be no misunderstandings. If problems areas are noted, the PI/FSDO should offer assistance if necessary.

**c.** Parts 91K, 121, 125, and 135, acceptance or approval process is completed; the PI or FSDO will approve the operator's OpSpecs, MSpecs if applicable, or LODA by making the appropriate entries and affix his or her signature.

**d.** Parts 91 operators do not have OpSpecs or MSpecs; however the acceptance or approval process is the same for all operators, and in the case of a part 91 operator (non part K operator), a letter is provided for acceptance or approval (See Appendix 2, Sample Letter of FAA Acceptance for Non-Certificate Holders, for a sample letter).

## **12. ARE THERE ANY RELATED DOCUMENTS?**

**a. Title 14 CFR:** parts 43, 61, 65, 91, 119, 121, 125, 129, 133, 135, 137, 141, 145, and 147.

**b. ACs:** 43.9-1, 91-78, 91.21-1, 120-64, 120-70, and 120-76 (as revised).

**c. FAA Orders.** Copies of the following documents may be purchased from: New Orders, Superintendent of Documents, P.O. Box 371954, Pittsburgh, PA 15250-7954.

(1) Order 8900.1, Flight Standards Information Management System.

## **13. DOES THIS AC CANCEL ANY PRIOR ACS?**

- This AC cancels AC 120-78, dated October 29, 2002.

## **14. HOW CAN ONE GET THIS AND OTHER FAA PUBLICATIONS?**

a. You can get the 14 CFR and those ACs for which there is a fee from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. You can view a list of all AC's at: [http://www.faa.gov/regulations\\_policies/advisory\\_circulars/](http://www.faa.gov/regulations_policies/advisory_circulars/). You can view the 14 CFR at: [http://www.access.gpo.gov/nara/cfr/cfrhtml\\_00/Title\\_14/14tab\\_00.html](http://www.access.gpo.gov/nara/cfr/cfrhtml_00/Title_14/14tab_00.html).

**U.S. Department of Transportation  
Subsequent Distribution Office  
Ardmore East Business Center  
3341 Q 75th Avenue  
Landover, MD 20785**

b. To be placed on FAA's mailing list for free ACs, contact:

**U.S. Department of Transportation  
Distribution Requirements Section,  
SVC-121.21  
Washington, D.C. 20590**

John M. Allen  
Director, Flight Standards Service

**APPENDIX 1. SAMPLE LETTER OF INTENT TO USE ELECTRONIC SIGNATURE,  
ELECTRONIC RECORDKEEPING, OR ELECTRONIC MANUALS**

[Requester Letterhead]

To: [FAA Flight Standards District Office with geographic jurisdiction over the requester's  
operations]

From: [Requester]

Date: [Date]

Subject: Use of Electronic System - Signatures/Recordkeeping/Manuals

This letter is to inform you that [requester] intends to use an electronic (signatures and/or recordkeeping and/or manual) system for [describe what the system will be used for]. This system has been established using the guidelines outlined in FAA Advisory Circular (AC) 120-78 (as amended).

This organization intends to implement the system on [date].

Company facilities, equipment, and personnel are available for your review and/or inspection at [address] on [date]. Please contact [name] at [telephone] to arrange a visit to review the system and to discuss any FAA concerns.

Thank you in advance for your assistance in this matter.

Sincerely,

[Requester]



**APPENDIX 2. SAMPLE LETTER OF FAA ACCEPTANCE FOR NON-CERTIFICATE  
HOLDERS**

Federal Aviation Administration  
San Antonio Flight Standards District Office  
1992 Barrett Avenue  
Travis, Texas 76321

[Date]

Mr. John Smith  
1234 South Airport Way  
San Antonio, Texas 78910

Dear Mr. Smith:

This letter confirms acceptance of the electronic system used by the owner/operator of [registration number or attached list]. The electronic system for (signatures, and/or recordkeeping, and/or manuals) meets the requirements of 14 CFR part 91. The accepted procedures meet the intent of the Advisory Circular (AC) 120-78 (as amended), "Acceptance and Use of Electronic Signatures, Electronic Recordkeeping Systems, and Electronic Manuals."

FAA acceptance is limited to those individuals who are trained by the owner/operator in the use of electronic equipment in accordance with the owner's/operator's required procedures.

This office should be notified of any significant changes in the design or operation of the system.

Any changes to designated FAA user identification codes or passwords should be submitted to the FAA Flight Standards District Office as soon as practical after the change.

Unless withdrawn, this letter is valid indefinitely, and should be transferred with the aircraft records as part of any aircraft ownership transfer.

Sincerely,

[Name]  
Aviation Safety Inspector [Operations and/or Maintenance]